ABSTRACT

A variety of bi-directional data transmission systems that facilitate communications between a plurality of remote units (15) and a central unit (10) using a frame based discrete multi-carrier transmission scheme are disclosed. In each of the systems, frames transmitted from the plurality of remote units (15) are synchronized at the central unit (10). A variety of novel modem arrangements and methods for coordinating communications between a plurality of remote units (15) and a central unit (10) to facilitate multi-point-to-point transmission are disclosed. The invention has application in a wide variety of data transmission schemes including Asymmetric Digital Subscriber Line systems that includes the transmission of signals over twisted pair, fiber and/or hybrid telephone lines, cable systems that includes the transmission of signals over a coaxial cable, and digital cellular television systems that include the transmission of radio signals.